Space Weather Forecast

Issued on Friday, 06 May 2022 at 01:25 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

Space Weather Forecast Headline: Further moderate flares likely resulting in R1/R2 radio blackouts. Chance of R3 from strong flares.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been moderate over the past 24 hours, with frequent common-class activity and two moderate class flares from AR3004 and AR3006 respectively. AR3004 is large and very complex magnetically and in the western hemisphere, while AR3006 is medium in size and magnetically complex in the southeast quadrant. There are two other remaining numbered sunspots on the visible disc, AR2999 and AR3001, both small, weak and stable regions.
There are no Earth-directed Coronal Mass Ejections (CMEs) visible in available satellite imagery.

Solar Wind / Geomagnetic Activity: The solar wind followed a slow regime, ranging generally between 300-400 km/s, while both the number of particles and their associated magnetic field were stable and weak. The net effect of the above solar wind measures was quiet geomagnetic activity throughout.

Energetic Particles / Solar Radiation: No solar radiation storms were observed in the period, despite the moderate-class X-ray flares.

Four-Day Space Weather Forecast Summary

Solar Activity: Further Moderate class flares are likely from either AR3004 or AR3006, with a daily chance of strong flares. No significant groups will rotate off the disc, while a new and potentially active region appears likely to rotate onto the southeast limb within the next day or two.

Solar Wind / Geomagnetic Activity: No 'coronal holes' (sources of recurrent fast solar wind) feature in the forecast, and Quiet geomagnetic activity is therefore most likely at first. From late tomorrow (7th) a CME may arrive. This is a re-analysed CME, which left the Sun on the 3th, and could reach Earth, leading to Unsettled to Active and possibly Minor Storm conditions from late tomorrow and into day 3 (8th). During day 4 geomagnetic conditions are expected to decline to become Quiet to Unsettled.

Energetic Particles / Solar Radiation: No solar radiation storms are expected. However, with the largest and most complex sunspot region now in the western hemisphere there is a daily slight chance of S1 or above should it produce a strong flare.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	30	40	5
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	70	70	70	70
Very Active	R3 to R5 X	No	20	20	20	20

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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